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STATE OF MARYLAND
CONSERVATION DEPARTMENT

SWEPSON EARLE, Commissioner

# MARYLAND'S EFFORTS TO SAVE *The* BLUE CRAB *of* CHESAPEAKE BAY

CONSERVATION BULLETIN No. 1

OCTOBER, 1924

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# *Saving the Crab from Annihilation*

**CRABS, both hard and soft, were very expensive this year, in some instances unobtainable at any price. They were dear because they were scarce.** That represents, perhaps, the sum total of the knowledge of the general public in regard to the scarcity of the edible crustacean known to scientists as CALLINECTES SAPIDUS, which, translated from the Latin, means "hard-shell dainty." Ordinarily, the crab eaten in various styles at home and in the restaurant is called the blue crab, because its upper surface, especially about the claws, is colored blue.

The blue crab, then, is expensive and scarce. It is the blue crab about which there has been much ado in the newspapers, because the laws regulating the catching of this welcome inhabitant of the Chesapeake Bay had to be enforced by the State Conservation Department. And enforcement of these laws involved sending boats to patrol the waters of the Bay controlled by Maryland. It is the blue crab, along with other matters, that has been the subject of recent conferences between Governor Albert C. Ritchie, of Maryland, and Governor E. Lee Trinkle, of Virginia, and the Conservation Commissioners of the two States.

It is this crab, both in its hard and soft states, that was so noticeably absent from the tables of Marylanders this year. Many accounts appeared in the newspapers in which were recorded the high prices of crabs. Now, the scarcity of crabs has become an old story. Few people there are who don't know that soft crabs cost this year from $3 to $4 a dozen, and hard crabs from 60c to $1.50 a dozen. Let it be mentioned once more in passing.

The aim of this pamphlet is to tell the public why crabs are scarce and therefore dear, and what can and ought

to be done to save the crab from permanent annihilation. To do this something of the nature and habits of the crab must be explained. Then it will become clear what is meant by the terms, "joint action of Maryland and Virginia, co-operation between the two States," and the like.

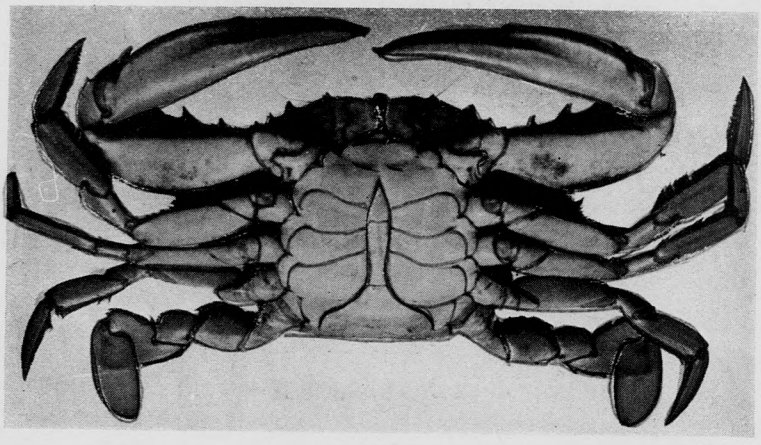

FIGURE I.

Abdominal, or under side, of adult male crab.

It is important to know, first of all, that the blue crab swims. It does not remain more or less stationary like the oyster. Dr. E. P. Churchill, Jr., Assistant, United States Bureau of Fisheries, records the following: "The blue crab is found on the Atlantic Coast from Massachusetts Bay to at least as far south as the northern part of South America. In the United States it is common from Massachusetts to the southern extremity of Texas.....It is especially abundant in Chesapeake Bay.....The young are very abundant in the region extending from the vicinity of Tangier Island, Va., to Baltimore, Md." These statements are found in Dr. Churchill's study, "The Life History of the Blue Crab," printed in 1919. It is important to note the fairly wide distribution of the blue crab, because the distribution gives some idea of the crab's swimming radius.

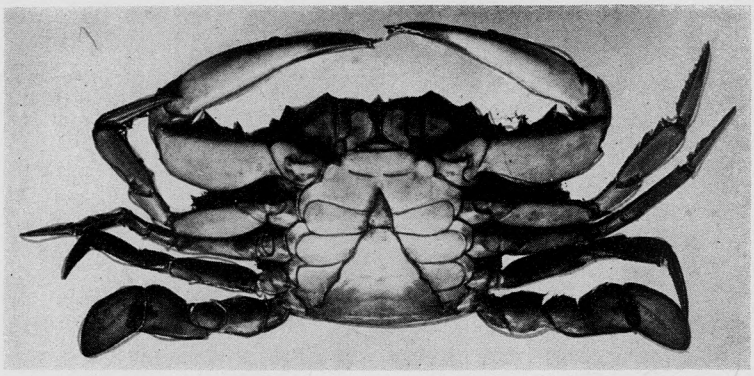

FIGURE II.

Bottom or under side of immature female crab, with triangular apron.

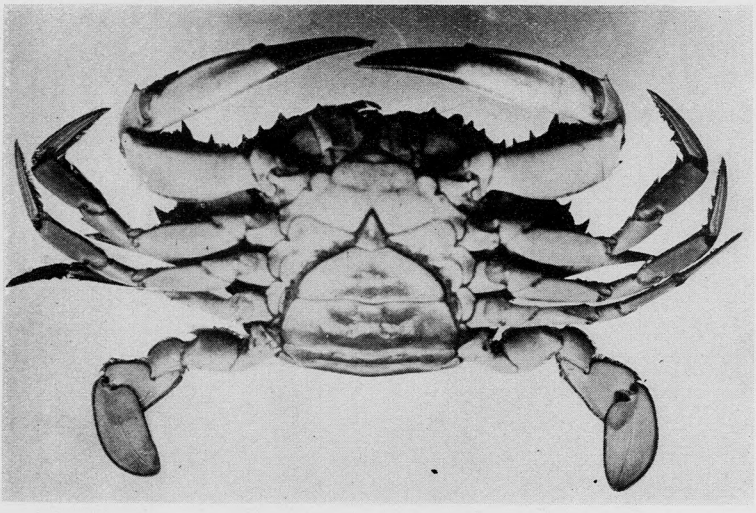

FIGURE III.

Bottom or under side of adult female showing broad apron. This crab has shed for the last time, and will develop the eggs and become what is known as a sponge crab, in nine months.

During the life of the crab in Chesapeake Bay, it is likely the crab propels itself by means of its two back fins over a territory covering several hundred miles. Most of the crabs in the Bay are hatched in the waters controlled by Virginia, in the lower Bay around the Capes, where the Bay empties into the Atlantic Ocean. Let us trace the movements of the crab from its birth through its nonage, or growing stages, to the time when it matures and is caught by the crabman.

It is now well known to those who have observed its movements that the female crab, when her eggs are hatching, seeks waters rich in salt. Salty water, such as is supplied by the Atlantic Ocean, seems to be necessary for the development of the eggs. But whatever the reason, the female crab with her numerous progeny makes for the Capes, where she permits her eggs to hatch. Each female crab bears from 1,750,000 to 2,000,000 eggs at a time. These eggs are carried on the abdomen of the female crab and form a sponge-like mass, about one-third the size of the crab. In this state the female crab is called the "sponge crab." The process of hatching eggs is called spawning.

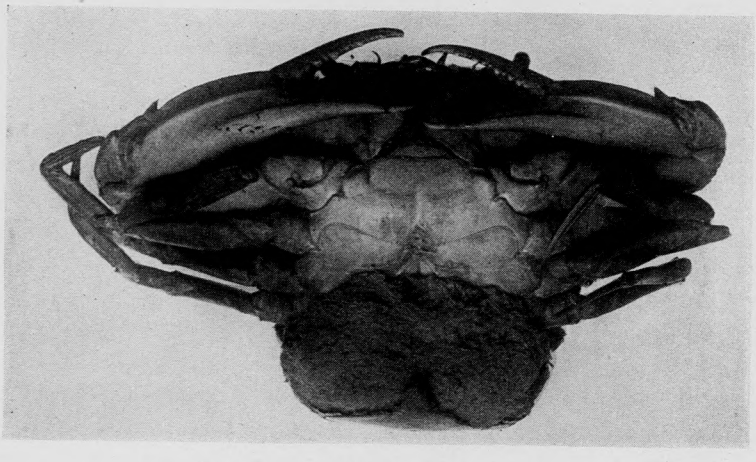

FIGURE IV.

Female crab showing the egg sponge developed on abdomen. The female in this state is caught in Virginia waters for market during the months of May and the first half of June.

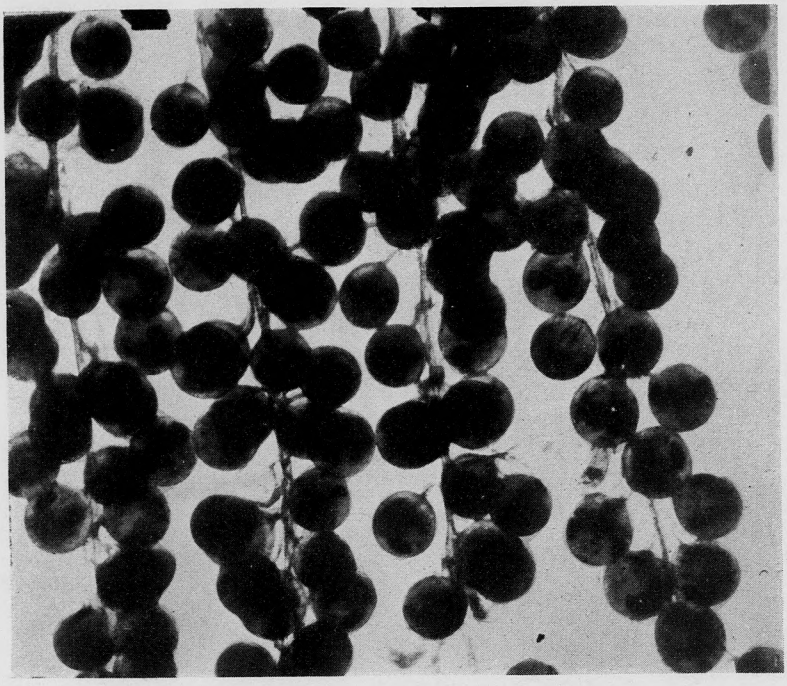

FIGURE V.

Photograph of magnified eggs attached to tiny hairs which form the egg sponge. A few empty shells from which the young have been hatched are shown. In many of the eggs, the eyes of the developed ZOEAS may be seen.

Spawning takes place in Virginia waters in the summer months. As soon as the young crabs are born they leave the mother and seek shallow water. Usually the little crabs migrate up the Bay and find creeks and other shallow waters to grow in. "The grassy bottoms of the Eastern Shore, in Tangier Sound, particularly, afford especially fine shedding grounds, and vast quantities of crabs are found there," says a bulletin published by the United States Bureau of Fisheries. The newly hatched crabs, which are so tiny in size that they cannot be seen with the naked eye, grow in shallow waters in successive stages. When the young crab comes out of its egg-shell it does not look at all like the grown-up crab which is served at table. In this respect the little crab is like a tadpole, which does not look

like the frog it will become when it grows up. The newly born crab is called by scientists a *zoea*, which comes from a Greek word meaning life. The *zoea* looks even less like the mature crab than the tadpole resembles the frog. (See Figure VI.) The *zoea*, like the mature crab, grows by shedding its hard shell at frequent intervals. Every time it emerges from its shell it becomes larger. The process of shedding the shell is called molting.

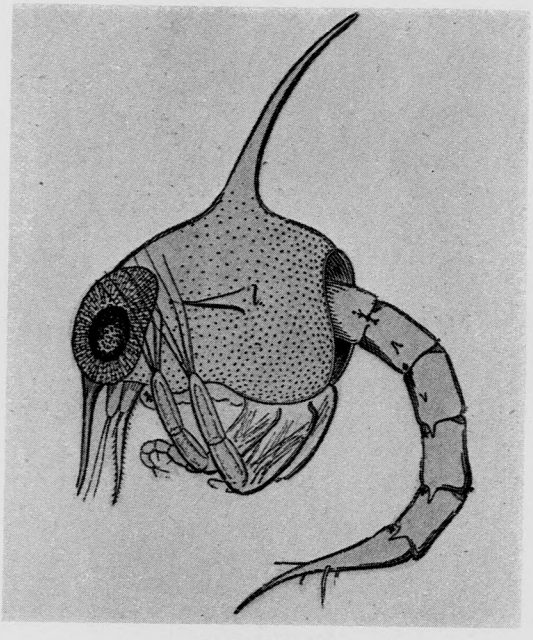

FIGURE VI.

The ZOEA form possessed by Blue Crab when first hatched.

The *zoea* sheds its shell about five times, and upon emerging from the shell the sixth time, it becomes a *megalops*. Now *megalon* is the Greek word for great or extended, so that *megalops* was chosen by scientists to designate extended life in the crab. Since *megalops* also means great, or large, it may be safely supposed that the word applies to the shape of the crab in this stage of its life. The *megalops* resembles the mature crab much more than the *zoea*. It has claws, large eyes, a pointed nose and eight side appen-

dages, or feelers, including the two posterior legs which propel the crab when it swims. (See Figure VII.)

The *megalops* swims freely and can walk on the bottom. Now the *megalops* molts, or sheds its shell, the same way as the little *zoea*, and after molting one or more times (the exact number is unknown) it takes on the shape of the crab as it is seen in the markets or in the huckster's basket. From the time the *zoea* emerges from its shell, swims about, sheds and becomes a *megalops*, till the latter changes into a regular crab, about one month elapses.

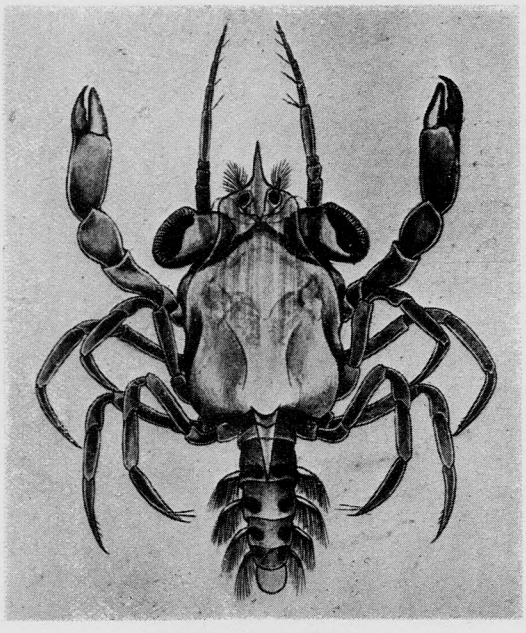

FIGURE VII.

MEGALOP, second form of Blue Crab attained after molting from ZOEA stage.

When the *megalops* becomes a crab, the latter is about one-eighth of an inch wide. The little crab searches about it for food and in doing so swims in every direction—up the Potomac River, up the Bay and into the rivers of Virginia. A great host of these tiny emigrants swims up the Bay into Maryland waters. At intervals that average 15 days,

the little crab sheds its hard shell, becoming temporarily a soft crab, and then re-assumes its hard shell. Every time it sheds its shell it becomes larger.

Assuming that most crabs of the Chesapeake Bay are born in the months of June and July, as scientists observe they do, the young crabs become fairly large in January and February of the following year. When winter sets in, the young crabs seek the bottom of deep waters to lie there till warm weather comes again. Usually the young crabs stay in Maryland waters during winter and spring. They become sluggish in the cold weather and lie on the bottom in a dormant state, in a sort of hibernation. Winter is a long period of rest, during which shedding dose not occur.

In the spring they are roused from their sleepiness and begin moving about again in search of food. Molting commences anew. They are not yet mature, or grown-up crabs, but must grow a little more, live a while longer. For this reason, it is most important that they be allowed to grow unmolested, for crabs cannot propagate and replenish the supply if they are taken from their natural habitat to be sold, cooked and eaten. If allowed to live, they will grow to maturity by July or August. Then they will mate. The female crab will return to Virginia waters to bear her young; the male crab will remain in Maryland waters. The life cycle of the crab will be complete.

Before explaining the measures that have been proposed to conserve the crab supply, it will be necessary to explain a few terms used in speaking of the crab. It has been related how the crab grows by shedding its hard shell, becoming a soft crab and then returning to its hard-shell state. As the crab grows it finds itself cramped in a shell that is "too small to fit." So, it bursts out of its shell gradually, the process requiring from 5 days to a week. At the very first stages of shedding, a black line, which in a day or two becomes a white line, appears around the two outer segments of the swimming legs. At this period the crab is called a "green" crab, but if it is taken by crabmen and placed in a float, the process of shedding will

cease. The green crab does not shed in captivity, differing in this respect from a "peeler" or a "buster." Many green crabs are wasted and the crab supply consequently depleted by crabmen who are careless in putting green crabs in floats, and then waiting in vain for the crabs to shed.

Left at large the green crab will continue the process of shedding and within a short period will become a "peeler." A peeler can be distinguished from an ordinary hard crab by a pink or red line on the edges of the two outer segments of its swimming legs, and a set of fine wrinkles on the blue skin between the wrist and upper arm of the claw. Peelers are well known to amateur fishermen as excellent fishing bait.

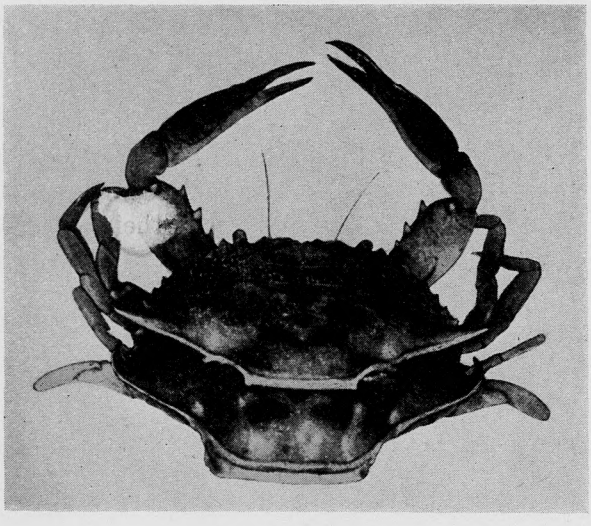

FIGURE VIII.

A "buster" crab, first stages of sloughing the hard shell.

As the crab passes the peeler state it lifts the upper shell, pushing itself out at first through the back, then through the front above the eyes. The lower, or abdominal, shell is loosened. In this stage the crab is called a "buster." Finally, the crab wrenches itself from the shell covering its claws and becomes free of its shell entirely. As a soft

crab it is flabby and somewhat helpless, although it is capable of walking or swimming slowly when disturbed. Unless caught by the crabman in this state, it will build itself another shell by excreting a substance over its body that hardens in water and forms a new shell. A soft crab makes itself a new shell in one day.

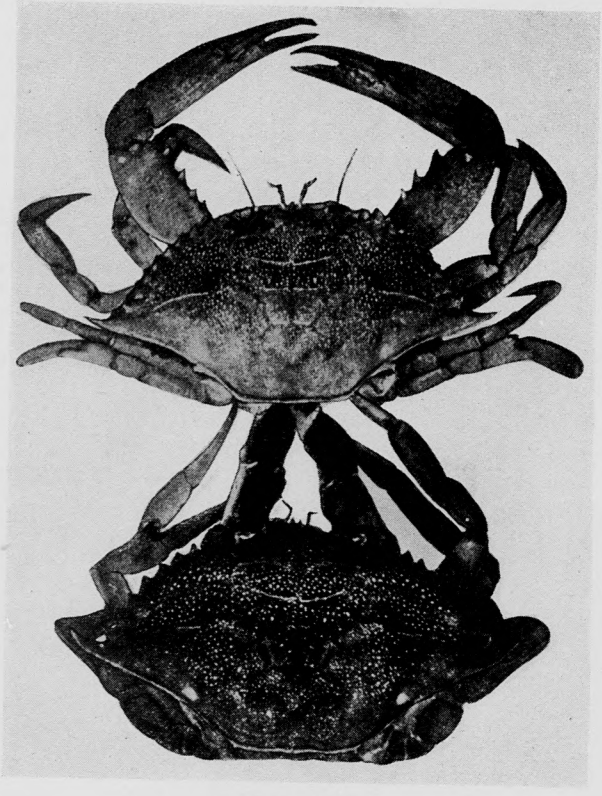

FIGURE IX.

Molting, last stages, showing soft crab with shell discarded.

The soft crab that has just become a hard crab is called a "buckram." It has used up much of its flesh in making a new shell, so that in the buckram state it is not a "meaty" crab, and is of little value to crabmen. But the buckram, if allowed to remain in the water, will find food and become a meaty and altogether delicious hard crab before it sheds

its shell again. During the past summer buckram crabs were wasted in extraordinary quantities by Maryland crabmen. This practice must be curbed if the crab industry is to survive. Crabmen are well aware of the fact, but awareness of a fact and the self-honesty of stamping out a stupid practice do not dovetail in practice as well as in theory.

What are the factors, then, that have contributed to deplete the crab supply of the Chesapeake Bay almost to the vanishing point? They are as follows: Virginia crabmen have killed untold millions of crabs by destroying the female sponge-crab with its eggs. The number of crabs that have been destroyed by this means is incalculable. Maryland crabmen have destroyed more millions through wasting buckram crabs and caging and killing green crabs. Both States have been catching immature, or undersized, crabs, which (if not wasted before they are marketed besides) are the future source of replenishing the crab supply.

In the report of the division of fishery industries by Lewis Radcliffe, Deputy U. S. Commissioner of Fisheries, the following mention is made in regard to the crab fishery of Maryland and Virginia:

"The decline of the crab fishery of Maryland and Virginia in recent years has been so rapid as to alarm those interested in its perpetuation, also to develop considerable interest as to the relative destructiveness of the various forms of apparatus of capture, and the regulatory measures necessary to restore the fishery to its former magnitude.....

"The total catch of crabs in these States in 1920 was 22,700,053 pounds, as compared with 50,343,268 in 1915, a decrease of 27,643,215 pounds, or 54.90 per cent. The decrease in Maryland in 1920 as compared with 1915 was 21,030,908 pounds, or 69.88 per cent, and in Virginia, 6,612,-307 pounds, or 32.65 per cent."

These figures represent a somewhat thriving condition, comparatively, of the crab industry in 1920. The precise figures for more recent years, including the summer of 1924, are not available. Estimates of the present crab

supply indicates, however, that depletion has gone ahead at full speed. So markedly low was the supply that Maryland crab packers last summer (1924) predicted annihilation of the industry. And a resolution was passed by them at Crisfield urging conservation of the supply upon the State of Virginia through co-operative legislation with Maryland.

"The crab of Chesapeake Bay," wrote Dr. Churchill, "was first put on the market in the year 1873 or 1874, shipments of soft crabs being made by Captain John H. Landon, from Crisfield, Md., to the firm of John Martin, of Philadelphia. The hard-crabbing industry was initiated in 1878 by James McMenamin, who opened a plant at Hampton, Va., for canning the meat of the hard crab.....

"Some trouble was at first experienced in finding a market for the crabs and the meat. Crabs were, to most persons, an unknown form of food and were even considered by many to be poisonous. Express agents and railroad employes, whose daily run took them through Crisfield, became familiar with the edible qualities of the soft crab and assisted in arousing the interest of fish and game dealers of the larger cities, such as Baltimore, Philadelphia and New York."

By 1880 the demand for crabs had become fairly widespread. With improved shipping facilities and the use of ice in packing soft crabs, the industry developed rapidly. In 1890 Maryland and Virginia crabmen caught and sold about 9,000,000 pounds of crabs and in 1900, approximately 20,000,000 pounds. The industry reached its peak in 1915, for which year the figures were cited in the statement on page 13 by Dr. Radcliffe. Since then there has been an uninterrupted and alarmingly steep decline. Until 1911 no thought at all had been given to the conservation of the crab, and conservation measures taken since then have borne entirely inadequate results.

Governor Albert C. Ritchie, Dr. Radcliffe of the U. S. Bureau of Fisheries and the Conservation Commissioner of Maryland went to the Potomac River to confer with Governor E. Lee Trinkle and W. McDonald Lee, Commissioner of

Fisheries of Virginia, September 9, 1924. Although no drastic measures for conserving the crab supply were agreed upon, the meeting is significant in that it indicates officials of both states are aroused as to the necessity of joint action if the crab industry of the two States is not to perish. At this conference Dr. Radcliffe recommended that the following measures be adopted by both States:

First—That Virginia should prohibit the catching of sponge crabs (the female crabs which are bearing eggs) during the entire year, instead of, as at present, June 15 to August 31.

Secondly—That Virginia should shorten her season for winter dredging for crabs from 6 months to 3 months.

Thirdly—That Maryland and Virginia should increase the legal length at which hard crabs may be caught from 5 inches to 6 inches (from tip to tip of spike), and Maryland should increase the legal length at which soft crabs may be taken from 3 to 3½ inches (from tip to tip of spike).

Finally, that Maryland and Virginia should pass laws to prevent the taking of the green crab and placing it in floats, since this crab does not shed in captivity, and, it is claimed, causes 60 per cent. of the waste in the crabbing industry.

Those who have tasted crabs have had registered indelibly upon their palates the deliciousness of this food. Others who ate crabs at restaurants last summer (1924) will recall no doubt the almost prohibitive expensiveness of these now luxurious dainties. Yet the Chesapeake Bay is as capable in 1924 as it was in 1880 of giving life to enough crabs to make them reasonably plentiful and cheap. The broad Atlantic is as salty today at the Capes it it was when Captain John Smith sailed upon it in 1607. The scarcity of crabs is not owing to any change in the natural environment of crabs. Nor have they themselves undergone any degeneration. They breed as freely as ever and find food in abundance after they are born. They have not been attacked by a blight, like the chestnut trees of Maryland.

To restore the supply of crabs in the Chesapeake Bay will not require great expenditures of money; it will not require much personal sacrifice; it will not even require any one to

work the harder for its accomplishment. **Give the crab a chance to breed naturally, prevent wasting of crabs, and the crab supply will replenish itself rapidly.** Support the movement to bring about a return to the good old days of plentiful crabs.

The following pamphlets have been consulted and quoted:

What the Crab Industry is Worth to Maryland—Swepson Earle.

Life History of the Blue Crab.—E. P. Churchill, Jr.

Crab Industry of Chesapeake Bay—E. P. Churchill, Jr.

Illustrations from U. S. Bureau of Fisheries photographs.

DO NOT CIRCULATE